



## Implementation of Neuroscience-Based Multiple Intelligences Theory: To Improve the Intelligence of Students in *Ma'had*

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**Abstract:** The development of the flow of Arabic knowledge at the pesantren level (Madrasah Aliyah, Madrasah Diniyah, and Madrasah Ta'wiliyah). Demanding increased Arabic learning to *santri*. However, this is inversely proportional to the fact that students are declining in developing Arabic *mufrodad* and linguistics material. This study aims to analyze the Arabic language learning model based on multiple intelligences from a neuroscience perspective. The setting of this research is located in the Himmatul 'Amilin Islamic Boarding School in Yogyakarta. The subjects of this research consisted of the leaders of Islamic boarding schools, *musyrif*, and *ustadz*. Subject selection was carried out using the purposive sampling technique to obtain objective and valid data. The approach in this research is to use a case study-based qualitative method. Researchers in collecting data using observation methods, direct interviews, and documentation. The data analysis technique was followed by Milies and Huberman, namely by displaying data, reducing data, and verifying data. The results of this study explain that learning Arabic based on multiple intelligences increases the intelligence of students in learning Arabic *mufrodad* and linguistics (*mufrodad*, Arabic morphology, and Arabic syntax). From some of the material taught, namely about everyday *mufrodad* and understanding of *shorof* in the *isim* file chapter. In this case, multiple intelligences are combined with neuroscientific theory between the interpersonal and intrapersonal intelligence centers in the right brain and left brain. This research has implications for the improvement and development of students in understanding Arabic material (*quwaidul arabiyah*) in today's Islamic boarding schools.

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## Introduction

Learning Arabic so far has not fully taught multiple intelligences with a

neuroscience approach.<sup>1</sup> This is evidenced by Putri's research which shows that only 10% of students have high intelligence, 90% moderate, and 8% low in learning Arabic.<sup>2</sup> In line with this, it was also proven by preliminary observations on Arabic language learning taught to basic level students of the Himmatul 'Amilin Islamic Boarding School in Yogyakarta which explained that during the Covid-19 pandemic, distance learning students did not respond to the level of intelligence of students.<sup>3</sup> Of the 10 students, only 8 students take part online, and 5 students can participate in active learning. In addition, online learning of Arabic during the Covid-19 pandemic is less responsive to learning for students who have not been able to take part in *binnadzor*, *muhadaroh*, and *muhotobah*.<sup>4</sup> As for online with Google Meet, it makes it easier for consultants to *ustadz* with private WhatsApp, live streaming Instagram, or other social media.<sup>5</sup> It was seen that only a few students were active in responding to the learning and teaching given by the *ustadz*.<sup>6</sup> This shows that learning in Islamic boarding schools has not been active in intelligence or material development in students.<sup>7</sup>

The theoretical problem has been studied by previous studies, as studied by Abu Bakar Siddiq, the importance of multiple intelligence learning in conveying material to students.<sup>8</sup> So that, learning is effective and easily accepted by students.<sup>9</sup> Theoretically, the problem has been studied by previous studies, the importance of multiple intelligence

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<sup>1</sup> Suyadi Suyadi, Zalik Nuryana, and Niki Alma Febriana Fauzi, "The Fiqh of Disaster: The Mitigation of Covid-19 in the Perspective of Islamic Education-Neuroscience," *International Journal of Disaster Risk Reduction* 51, no. 2 (2020): 1–15, <https://doi.org/doi.org/10.1016/J.ijdr.2020.101848>.

<sup>2</sup> Hesty Maulida Eka Putry and Muassomah, "Tiktok Application as a Project-Based Arabic Learning Media," *Alsinatuna* 7, no. 2 (2021): 139–154.

<sup>3</sup> Andy Hadiyanto, Cendra Samitri, and Siti Maria Ulfah, "Model Pembelajaran Bahasa Arab Multiliterasi Berbasis Kearifan Lokal di Penguruan Tinggi Negeri," *Hayula: Indonesian Journal of Multidisciplinary Islamic Studies* 4, no. 1 (2020): 117–140.

<sup>4</sup> Asad Q. Ahmed, "The Reception of Avicenna's Theory of Motion in the Twelfth Century," *Arabic Sciences and Philosophy* 26, no. 2 (2016): 215–243, <https://doi.org/10.1017/S0957423916000023>.

<sup>5</sup> Jan Thiele, "Conceptions of Self-Determination in Fourth/Tenth-Century Muslim Theology: Al-Bāqillānī's Theory of Human Acts in Its Historical Context," *Arabic Sciences and Philosophy* 26 (2016): 268–294, <https://doi.org/10.1017/S0957423916000035>.

<sup>6</sup> Angel Colmenares, Xu Yan, and Weiguo Wang, "Determinants in the Forecast of the Gross National Income of China and India from 1952 to 2015," *Journal of Management Science and Engineering* 6 (2021): 268–294, <https://doi.org/10.1016/j.jmse.2021.06.001>.

<sup>7</sup> Ingvild Aase et al., "Cognitive Predictors of Longitudinal Positive Symptom Course in Clinical High Risk for Psychosis," *Schizophrenia Research: Cognition* 26 (2021): 1–7, <https://doi.org/10.1016/j.scog.2021.100210>.

<sup>8</sup> Abu Bakar Shiddiq, "The Application of «Nemo» Artificial Intelligence in Arabic Language Learning in the 4.0 Revolution Era at Al- Khalifah Islamic Boarding School Cibubur," *International Journal of Language Education and Culture Review (IJLECR)* 6, no. 1 (2020): 58–61, <https://doi.org/10.21009/ijlecr.061.07>.

learning in delivering material to students.<sup>10</sup> Therefore, learning is effective and easily accepted by students. The birth of this theory was motivated by Branton C Shearer to give rise to a new paradigm of education and learning, especially related to the concept of intelligence.<sup>11</sup> This is following the problems that occurred in the Himmatul 'Amilin Islamic Boarding School in Yogyakarta, learning Arabic, especially memorizing *mufradat* and how to read *mufradat* students, in general, have not mastered.

So far, there has been much research on multiple intelligences and the theory of multiple intelligences.<sup>12</sup> There is concrete evidence from research by Mishar that the theory of multiple intelligences can be juxtaposed with the theory of neuroscience in the human brain.<sup>13</sup> Abdulwahid in his research on the theory of multi-intelligence as the basis for learning Arabic, is a study in literature research.<sup>14</sup> Suggests that it is important to update the way of teaching in the classroom both among students or students with multiple intelligences.<sup>15</sup> Finally, Zainal Arifan research states that the Arabic language learning model is based on the theory of multiple intelligences as a relevant learning base in today's learning.<sup>16</sup> As for several novelties in previous research, this research is still new and focuses on discussing the application of neuroscience-based multiple intelligence learning models in Islamic boarding schools in Yogyakarta. Some researchers focus on the evaluation of learning by using multiple intelligences learning approach. This research mentions that multiple intelligences is an evaluation of Arabic

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<sup>9</sup> Zainal Arifin Ahmad, "Pengembangan Model Pembelajaran Bahasa Arab Berbasis Teori Multiple Intelligence," *Al Mahāra: Jurnal Pendidikan Bahasa Arab* 1, no. 1 (2015): 1–18, <https://doi.org/10.14421/almahara.2015.011-01>.

<sup>10</sup> Chad Luke et al., "Counselors' Perceptions of Ethical Considerations for Integrating Neuroscience With Counseling," *The Professional Counselor* 10, no. 2 (2020): 204–219, <https://doi.org/10.15241/cl.10.2.204>.

<sup>11</sup> Branton C Shearer, "The Theory of Multiple Intelligences After 40 Years: A Scientific Idea Whose Time Has Come or Gone?," *An Interdisciplinary Journal Wwww.Psychologyandeducation.Net* 57, no. 7 (2020): 487–494.

<sup>12</sup> Uril Bahrudin, Halomoan, and Mualimin Mochammad Sahid, "Implementation of Hots in Debate Strategy to Improve the Ability of Speaking Arabic Among Students," *Solid State Technology* 63, no. 4 (2020): 816–826.

<sup>13</sup> Rezki Mishar and Yuni R. Bangun, "Create the EQ Modelling Instrument Based on Goleman and Bar-On Models and Psychological Defense Mechanisms," *Procedia - Social and Behavioral Sciences* 115 2013 (2014): 394–406, <https://doi.org/10.1016/j.sbspro.2014.02.446>.

<sup>14</sup> Abdulwahid Qasem Al Zumor, "Challenges of Using EMI in Teaching and Learning of University Scientific Disciplines: Student Voice," *International Journal of Language Education* 3, no. 1 (2019): 74–90, <https://doi.org/10.26858/ijole.v1i1.7510>.

<sup>15</sup> Ahmed Alwishah, "Avicenna on Animal Self-Awareness, Cognition and Identity," *Arabic Sciences and Philosophy* 26 (2016): 73–96, <https://doi.org/10.1017/S0957423915000120>.

<sup>16</sup> Zainal Arifin Ahmad, "Pengembangan Model Pembelajaran Bahasa Arab Berbasis Teori Multiple Intelligence," *al Mahāra: Jurnal Pendidikan Bahasa Arab* 1, no. 1 (2015): 1–22, <https://doi.org/10.14421/almahara.2015.011-01>.

language material related to *mufradat* in Islamic boarding schools. Meanwhile, there is limited research on literature research (library study) initiated by Gagner, related to multiple intelligences.

The specific purpose of this research is to apply the multiple intelligence learning models in learning Arabic. Learning that focuses and leads to the intelligence of students at the Himmatul 'Amilin Islamic Boarding School in Yogyakarta. Multiple intelligence learning relies on the student's brains in other terms with a neuroscience learning approach. The final goal is that students can interact with other friends and increase their intelligence of students. The method used in this research is a case study-based qualitative method.

## Methods

In this study, the respondents were several administrators and leaders of the Himmatul 'Amilin Islamic Boarding School, *ustadz*, *musyrif*, and especially students.<sup>17</sup> The subject of this research is about learning Arabic based on multiple intelligence with a neuroscience approach.<sup>18</sup> The reason for choosing the research subjects was to analyze and find out the Arabic language learning that was responded to by students with multiple intelligences. During the learning process, *mufradat* and Arabic linguistics such as the *shorof kitab* in the study of the *ism fail* chapter in Islamic boarding schools. The object of this research is the Himmatul 'Amilin Islamic Boarding School as an implementing institution for Islamic boarding school education and Arabic language learning in Yogyakarta (Giwangan, Umbulharjo). The location of this research is in one province in one district, namely the city of Yogyakarta. The reason the researcher chose the Himmatul 'Amilin research setting as research setting was because the Islamic boarding school represented the needs and objectives of this study, namely to analyze the implementation of Arabic learning taught by *ustadz* with multiple intelligences.

The data source of this research comes from the analysis of case studies or field studies at the Himmatul 'Amilin Islamic Boarding School. The data sources for this research are supported by online news and sources from Scopus data literature (Sien

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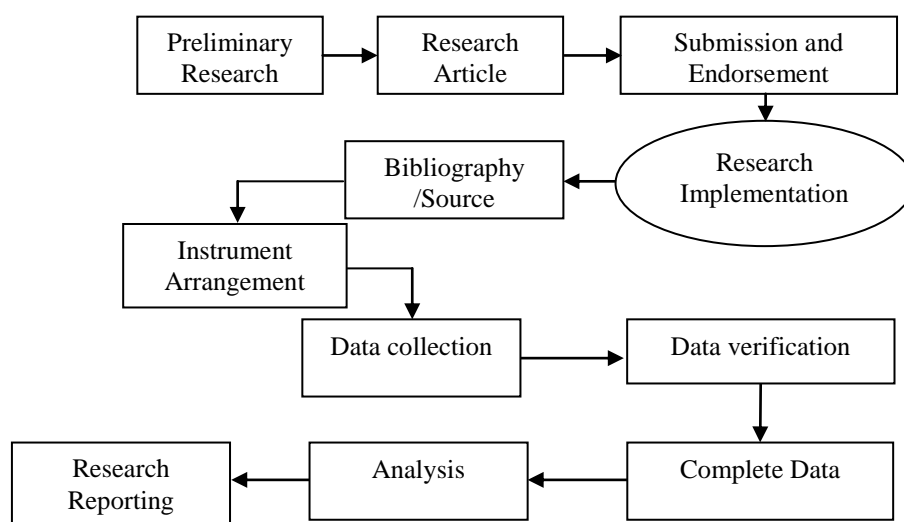
<sup>17</sup> Sugiyono, *Metode Penelitian Kuantitatif Kualitatif Dan R&D*, (Bandung: Alfabeta, 2017).

<sup>18</sup> Suyadi Suyadi, Zalik Nuryana, and Sutrisno Sutrisno, "The Religion in Higher Education Curriculum Referring to Indonesian Qualification Framework: The Inclusion of Neuroscience and Anti-Corruption Education," *International Journal of Education and Learning* 3, no. 1 (2021): 38–44, <https://doi.org/10.31763/ijelev.v3i1.93>.

Direct), Google Scholar, and literature data from the Publish or Perish application. Data related to interviews through direct interviews with research subjects namely *musrif*, *mudir*, and students in the boarding school. Subject selection was carried out using a purposive sampling technique. With the reason to get information/data in detail and truth.

The data collection technique in this study was using the direct interview method to the research location, namely with the research subjects. Therefore, the method uses direct observation of the research location, related to the state of events that occur in the research setting. Observations are carried out universally, meaning that not only the learning process during learning is ongoing, but also social conditions, the strategic location of Islamic boarding schools, Islamic boarding schools infrastructure, and management of Islamic boarding schools. Next is data collection using the documentation method, namely matters relating to documentation, for example, the archives of Islamic boarding schools and pictures or photos of Islamic boarding schools.

Research informants consisted of 10 *santri*, a *musyrif*, an *ustadz*, and a *mudir* (boarding school leader). The research informants were carried out using a purposive sampling technique. It means that the reason for choosing the research subject is to find out credible informants and data sources.<sup>19</sup> While the research steps can be seen in the following research flow chart:



**Figure 1.** Research Flow

<sup>19</sup> John, W. Creswell. *Penelitian kualitatif dan desain riset, memilih diantara lima pendekatan*, (Yogyakarta: Pustaka Pelajar, 2014).

The data analysis method in this research uses content analysis, which is analyzing the message content of communication contained in the data. The analysis will also be carried out based on the chronological case of events that emphasize turning points or epiphanies in the participant's lives. The analysis steps begin with verifying the data, looking at the data from case to case so that it can be seen. The first, the basic idea of learning the Arabic language, the second is educational process, and the last multiple intelligence approach from a neuroscience perspective from Himmatul ‘Amilin Islamic.

## Results and Discussion

### Application of Brain Intelligence-Based Learning

In an interview with *mudir* of the Himmatul ‘Amilin Islamic Boarding School that the multiple intelligences applied had a good impact on the development of learning and understanding Arabic. He evidenced by the results of the report cards each semester or the results of evaluations reviewed by the leadership of the pesantren. A sample of 10 students leads to maximum learning. The previous interview shows that the Himmatul ‘Amilin Islamic Boarding School is under the auspices of the ministry of education and the Ministry of Religion. However, in general, they are more inclined to the authority for Arabic education and learning at the Ministry of Religion.<sup>20</sup> Basically the learning in the boarding school is the same as in other lodges.<sup>21</sup> However, the Himmatul ‘Amilin Islamic hut combines or gives a new atmosphere to learning Arabic learning that emphasizes the level of brain intelligence.<sup>22</sup>

**Table 1.** Learning Outcome Processes Learning Multiple Intelligence

No	Student Name	Outcome Learning
1	M H	80 %
2	A H	75 %
3	K B L	80%
4	S C K	80%
5	I S R	90%
6	A M N	90%
7	A J S	80%

<sup>20</sup> Muhammad Afif Amrulloh and Munirul Ikhwan, “Stylistic of The Qur’an: Reading The Story of Sulaiman,” *Arabiyat : Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban* 8, no. 1 (2021): 17–31, doi: <http://dx.doi.org/10.15408/a.v8i1.18906>.

<sup>21</sup> Azkia Muharom Albantani and Ahmad Madkur, “Musyahadat Al Fidyu: Youtube-Based Teaching and Learning of Arabic as Foreign Language (AFL),” *Dinamika Ilmu* 17, no. 2 (2017): 291–308, <https://doi.org/10.21093/di.v17i2.854>.

<sup>22</sup> Suyadi Suyadi and Hendro Widodo, “Millennialization of Islamic Education Based on Neuroscience in the Third Generation University in Yogyakarta Indonesia,” *QIJIS: Qudus International Journal of Islamic Studies* 7, no. 1 (2019): 173–202, <https://doi.org/10.21043/qijis.v7i1.4922>.

Based on data of table 1, the researchers found that the use of multiple intelligence-based learning combined with neuroscience had a good effect on students. Seen from the sampling of seven students above, shows that the standard number is above the average student who can take Arabic grammar and vocabulary well. The mix of learning at the cottage is mixed in a week. Between *mufradat* learning and yellow book learning, or learning that leads to linguistic learning.<sup>23</sup> It refers to Gardner's theory. At first, the orientation of education and learning was more directed to the development of intellectual intelligence.<sup>24</sup> IQ is the only measure of intelligence. Individual diversity in the aspect of intelligence is not supported. Even though the evidence shows that people who are successful in life do not always depend on the level of their intellectual intelligence. The success of a person's life occurs in many fields. Some are successful in the arts, sports, social, and so on.

Based on the theory that can be developed and initiated by Howard Gardner, eight bits of human intelligence can be developed.<sup>25</sup> These intelligences are known as multiple intelligences, which include linguistic, musical, interpersonal, intrapersonal, and naturalist intelligence.<sup>26</sup> Because the learning in the cottage leads to learning based on neuroscience intelligence, the principles and concepts of multiple intelligences in learning Arabic.<sup>27</sup> Through the correct and tested Arabic language learning references and curriculum. Teaching Arabic provides vocabulary and book lessons for every *santri* who is born in an empty state attached to the human identity itself. Then, parents and their environment will influence their habits and knowledge. Age is in the learning stage as a period that will take place at higher levels of learning and education.<sup>28</sup>

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<sup>23</sup> Marilyn Booth, "Zaynab Fawwāz's Feminist Locutions," *Journal of Arabic Literature* 52, (2021): 37–67, <https://doi.org/10.1163/1570064x-12341419>.

<sup>24</sup> Muhammad Thohir et al., "From Disruption to Mobilization: Ire Teachers' Perspectives on Independent Learning Policy," *Cakrawala Pendidikan* 40, no. 2 (2021): 359–373, <https://doi.org/10.21831/cp.v40i2.39540>.

<sup>25</sup> Suyadi Suyadi et al., "Academic Reform and Sustainability of Islamic Higher Education in Indonesia," *International Journal of Educational Development* 89 (2022): 1-11, <https://doi.org/10.1016/j.ijedudev.2021.102534>.

<sup>26</sup> Desfa Yusmaliana et al., "Creative Imagination Base on Neuroscience : A Development and Validation of Teacher ' s Module in Covid-19 Affected Schools," *Universal Journal of Educational Research* 8 (2020): 5849–5858, <https://doi.org/10.13189/ujer.2020.082218>.

<sup>27</sup> Zalik Nuryana and Suyadi Suyadi, "Character Development Based on Hidden Curriculum at the Disaster-Prone School," *Journal of Education and Learning (EduLearn)* 13, no. 2 (2019): 219–225, <https://doi.org/10.11591/edulearn.v13i2.10058>.

<sup>28</sup> Suyadi Suyadi, "Hybridization of Islamic Education and Neuroscience: Transdisciplinary Studies of Aql in the Quran and the Brain in Neuroscience," *Dinamika Ilmu* 19, no. 2 (2019): 237–249, doi: <http://doi.org/10.21093/di.v19i2.1601>.

Learning at the cottage can also be applied and developed in the academic world in college, especially in Arabic language and literature courses or Arabic language education.<sup>29</sup> So far, the learning developed in Islamic boarding schools is generally conventional based on what is known as the term students are told to read, write, memorize, and *muhadatsah* in *muhadatsah* or *mufradat allugoh* lessons. For those who study the yellow book, students are usually asked to practice first, read together, and then be accompanied by the *ustadz*. However, this gives researchers a new environment and offer for the managers of Islamic boarding schools. Through learning based on neuroscience intelligence, as the main focus is neuroscience. So far, none of the Islamic boarding schools has touched on neuroscience-based learning, even though this is very important in maximizing brain function, more than that, neuroscience has become a tool in curriculum development.<sup>30</sup>

Incorporating subjects on reason (neuroscience) into the curriculum of Islamic educational institutions, especially in Arabic subjects into learning that is in the boarding school is very useful to improve the intelligence of students. With a neuroscience approach, such as multiple intelligences, brain-based learning, quantum learning, and quantum teaching as a contribution to neuroscience for Arabic language education.<sup>31</sup> The brain is the focus of feelings and behavior. It is the brain that receives and experiences events, everything begins and ends in the brain, the way the brain works determines the quality of human life, which includes the level of intelligence, quality with other people, and success in the profession.<sup>32</sup> The brain regulates all bodily functions, controlling most human behavior from eating, drinking, sleeping, warming the body, and so on.<sup>33</sup> The brain is responsible for all life activities.

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<sup>29</sup> Suyadi Suyadi and Sutrisno Sutrisno, "A Genealogical Study of Islamic Education Science at The Faculty of Ilmu Tarbiyah Dan Keguruan UIN Sunan Kalijaga," *Al-Jami'ah: Journal of Islamic Studies* 56, no. 1 (2018): 29–58, <https://doi.org/10.14421/ajis>.

<sup>30</sup> Zahra Tarvirdizdeh and Vahid Nimehchisalem, "Rhetorical Structure in the Problem Statement Section of Iranian Postgraduate Students' Research Projects," *Studies in English Language and Education* 8, no. 2 (2021): 578–595, <https://doi.org/10.24815/siele.v8i2.19118>.

<sup>31</sup> Ahmad I Alhojailan, "Developing an Understanding of The Sources of Graduate Students' Perceptions of Academic Writing," *Indonesian Journal of Applied Linguistics* 11, no. 2 (2021): 281–291, <https://doi.org/10.17509/ijal.v11i2.34265>.

<sup>32</sup> Dina Merris Maya Sari and Yudy Prasetyo, "Project-Based-Learning on Critical Reading Course to Enhance Critical Thinking Skills," *Studies in English Language and Education* 8, no. 2 (2021): 442–456, <https://doi.org/10.24815/siele.v8i2.18407>.

<sup>33</sup> Priscila Rubbo, Claudia Tania Picinin, and Luiz Alberto Pilatti, "Innovation and Economic Complexity in BRICS," *Int. J. Knowledge Management Studies* 12, no. 1 (2021): 66–79, <https://doi.org/10.1504/IJKMS.2021.112222>.



The Himmatul ‘Amilin Islamic Boarding School is a boarding school that respects Arabic language learning. As an educational institution that can not be doubted in the development of brain intelligence.<sup>34</sup> To improve the intelligence of students in processing and developing Arabic language materials. The following is one of the descriptions of Neuroscience-Based Multiple Intelligences in Arabic language learning:



**Figure 2.** Neuroscience-Based Multiple Intelligences

Based on figure 2, a reference and reference book by researchers to analyze and develop Arabic language learning with a neuroscience-based multiple intelligences model. For language learning Arabic *mufradat* basic material that is between everyday knowledge and everyday life. Students are told to memorize and practice when finished at dawn. Each of the students is told to memorize five *mufradat* every day. Every Friday after dawn, all students are collected and the practice of *mufradat* has been memorized. This is according to what was conveyed by the companion of the Islamic boarding school MN said that the learning of *mufradat* material in the Himmatul ‘Amilin Islamic Boarding School is learning Arabic. The *mufradat* conveyed to the students is not far from the "yaumiyah" vocabulary in everyday knowledge. To make it easier to memorize and practice vocabulary in every corner of the cottage and room, students are given Arabic reading and writing *mufradat*. Usually, students are invited to tour the courtyard of the Islamic boarding school, in a large yard under the trees. To foster a relaxed and fresh mind in memorizing and receiving *mufradat* materials from the *ustadz*. This is to

<sup>34</sup> Sergio Miguel Pereira Soares et al., "Determinants of Bilingualism Predict Dynamic Changes in Resting State EEG Oscillations," *Brain and Language* 223 (2021), <https://doi.org/10.1016/j.bandl.2021.105030>.

foster brain stimulation and the emergence of intelligence in thinking. Manage materials with the right brain and left brain.<sup>35</sup>

### Linguistic-Based Arabic Learning on Multiple Intelligences

Based on the results of an interview from *musyrif* Islamic boarding school, that linguistics here is included in applied linguistics which focuses on Arabic linguistics. Arabic linguistics applied in the cottage is more directed to basic linguistics, namely Arabic syntax, and Arabic morphology. The Arabic syntax used for the book material is the Jurumiah book, namely the basic Nahwu book. Those related to *isim*, *fiil*, letters in *babul i'rob*, signs of *isim* as for the *fiil* signs and letters. As for the Arabic morphology, the book used is the book *Al-Amsilah Attasriffiyah*.

One example of *shorof* learning material on how to understand file names in Arabic:

**Table 2.** For *fi'il sulasi mujarrod* chapters one to chapter four, follow *wazn فاعل*

Meaning	اسم الفاعل	Meaning	الفعل الماضي	البناء
The one who helps	نَاصِرٌ	help	نَصَرَ	الصاحيح السالم

The description of tables 2 is one of the *shorof* materials taught at the Himmatul 'Amilin Islamic Boarding School Yogyakarta. *Santri* is directed to study and understand the arrangement of the *isim* file along with the *wazan* and *muzunya* in the book *Al-Amsilah At-Tasriffiyah*. This is in line with the theoretical concept of multiple intelligences, the next concept is linguistic intelligence.<sup>36</sup> Linguistic intelligence is the ability to use words effectively, both orally (eg storytellers, operators) and in writing (eg writers, journalists). This intelligence includes the ability to manipulate grammar and

<sup>35</sup> Agung Setiyawan, "Problematika Keragaman Latar Belakang Pendidikan Mahasiswa Dan Kebijakan Program Pembelajaran Bahasa Arab," *Arabiyat : Jurnal Pendidikan Bahasa Arab dan Kebahasaaraban* 5, no. 2 (2018): 195–213, <https://doi.org/10.15408/a.v5i2.6803>.

<sup>36</sup> Katherine C. Hustad et al., "Speech Development between 30 and 119 Months in Typical Children i: Intelligibility Growth Curves for Single-Word and Multiword Productions," *Journal of Speech, Language, and Hearing Research* 64 (2021): 3707–3719, [https://doi.org/10.1044/2021\\_JSLHR-21-00142](https://doi.org/10.1044/2021_JSLHR-21-00142).

language structure, phonology or language sounds,<sup>37</sup> pragmatic dimension, or practical use of language.<sup>38</sup>

According to the concepts and principles of the theory of multiple intelligences, there are eight sections.<sup>39</sup> The concept of intelligence in history has undergone many changes in the minds of scientists and education experts. Many have abandoned this concept partially or completely. Instead, they investigate cognitive abilities, problem-solving, and intelligence in a variety of ways. For example, by investigating the functional nervous system that underlies intellectual achievement. One of the concepts related to intelligence is multiple intelligences.<sup>40</sup>

Multiple intelligences introduced by Howard Gardner through the book *Frame of Mind: Theory of Multiple Intelligences* is a revolutionary idea in 1983.<sup>41</sup> Previously, psychologists were interested in general intelligence, namely a person's ability to solve problems and apply logical reasoning in various disciplines.<sup>42</sup> The idea of general intelligence was partially popularized by IQ (intelligence quotient) tests in the early 1900s to assess a child's ability to understand, reason, and make judgments.<sup>43</sup> Researchers analyzed the data on the *mufradat* material taught in the Luqmaniyah Islamic boarding school in Yogyakarta, analyzed with the theory and concept of multiple intelligences based on neuroscience.

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<sup>37</sup> Mahyudin Ritonga et al., "Arabic as Foreign Language Learning in Pandemic COVID-19 as Perceived by Students and Teachers," *Linguistics and Culture Review* 5, no. 1 (2021): 75–92, <https://lingcure.org/index.php/journal/article/view/726>.

<sup>38</sup> Kelly A. Vaughn et al., "Cortical Thickness in Bilingual and Monolingual Children: Relationships to Language Use and Language Skill," *NeuroImage* 243, (2021): 1-11, <https://doi.org/10.1016/j.neuroimage.2021.118560>.

<sup>39</sup> Dieuwerke Rutgers et al., "Multilingualism, Multilingual Identity and Academic Attainment: Evidence from Secondary Schools in England," *Journal of Language, Identity & Education* (2021): 1–19, <https://doi.org/10.1080/15348458.2021.1986397>.

<sup>40</sup> Carmen Argondizzo and Gillian Mansfield, "Wellbeing in Language Learning and Teaching," *CercleS* 11, no. 2 (2021): 263–268, <https://doi.org/10.1515/cercles-2021-2034>.

<sup>41</sup> François Thierry, "Arlette Nègre et Le Cabinet Des Médailles," *Arabica* 67 (2020): 458–459, <https://doi.org/10.1163/15700585-12341583>.

<sup>42</sup> Jamal Giaber and Hala Sharkas, "Rendering Translation Studies Terminology from English into Arabic: Identification of Methodology and Assessment of Adequacy," *International Journal of Arabic-English Studies (IJAES)* 21, no. 2 (2021): 125–146, <https://doi.org/10.33806/ijaes2000.21.2.7>.

<sup>43</sup> Nunung Nursyamsiah et al., "Stylistics of Nida Ilahi and Its Implications in Character Learning." *Jurnal Al Bayan: Jurnal Jurusan Pendidikan Bahasa Arab* 13, no. 2 (2021): 353–68. <https://doi.org/10.24042/albayan.v13i2.9247>.

**Table 3.** Multiple intelligences with neuroscience concepts

<b>Kind of Intelligence</b>	<b>Brain Part</b>	<b>Place</b>
Interpersonal	Frontal Parietal Temporal Cingulate	Medial-Temporal Amygdala Dorsolateral Prefrontal Cortex (PFC) Superior Temporal Sulcus (STS)
Intrapersonal	Frontal Parietal Cingulate Temporal Subcortical	Prefrontal-Cortex Anterior Cingulate Cortex (ACC) Dorsolateral Prefrontal Cortex Lateral Prefrontal Ventromedial Prefrontal Cortex
Logical (Mathematical)	Frontal Parietal Temporal	Prefrontal Cortex Intraparietal Sulcus Inferior Parietal Lobule
Verbal (Linguistics)	Temporal Frontal Parietal	Superior Temporal Gyrus (STG) Inferior Frontal Gyrus Broca area Posterior Inferior Frontal Gyrus
Visual	Frontal Parietal Temporal Occipital	Superior Temporal Gyrus Premotor Cortex Motor Cortex Prefrontal
Musical	Frontal Temporal subcortical	Superior Temporal Gyrus Primary auditory cortex Premotor cortex Basal ganglia Supplementary motor area
Kinesthetic	Frontal Parietal Subcortical cerebellum	Motor cortex Primary motor cortex Premotor cortex Basal ganglia
Naturalist	Temporal subcortical	Superior temporal sulcus Amygdala Brain stem Thalamus Midbrain Basal ganglia

Intelligence pluralism is the ability of self-capacity to measure and be used in making decisions, solving problems, and or producing effective learning that is easily accepted by students. Intelligence differs from skill in its depth, range, and complexity. Each multiple intelligence is a combination of related skills and this describes its complex neural picture. Implementing the application of neuroscientific findings in learning is a complex endeavor that for now may be just the beginning of a long journey towards effective interaction between neuroscientists and practitioners of the Arabic language.<sup>44</sup> From this cognitive classification, according to Bloom, there are six thinking hierarchies, the first is knowledge or knowledge, the second is understanding or

comprehension, the third is application or allocation, the fourth is analysis, the fifth is synthesis, and the sixth is evaluation. Which is often known as C1 to C6.<sup>45</sup>

The research implication is contributing to Arabic language learning in Himmatul ‘Amilin Islamic Boarding School. Facilitate students in developing the learning provided by the *ustadz* to the students. The multiple intelligences-based learning models not only lead to the intelligence of student’s brains but also leads to the ability of the *ustadz* in modifying learning that aims to be accepted by students. Multiple intelligences as a learning model that is implemented for students both in the Islamic boarding school environment and in the Islamic boarding school. Weaknesses and limitations in this study are researchers have not explored the research in detail because there are limitations in analyzing data and processing data. Researchers have not conveyed multiple intelligences with a perfect neuroscience approach. Therefore, the researcher recommends the next researcher study and discuss multiple intelligences based on neuroscience in the method aspect. Multiple intelligences associated with the output product with the Research and Development method (RnD). Multiple intelligences are based on scientific interdisciplinary science focusing on the brains of both students and students.

## Conclusion

Based on the results and discussion, it turns out that learning Arabic at the Himmatul ‘Amilin boarding school in Yogyakarta needs to be strengthened with modern learning models. Multiple intelligences-based learning with a neuroscience approach. Which aims to improve the intelligence center of students in memorizing *mufrodāt*, being able to master reading the book of *Jurimiah* and *Al-Amtsilah Attasrifiiyyah* (Arabic linguistics). Meanwhile, students learn about file names in the basic book of *Al-Amtsilah Attasrifiiyyah*. As for the reinforcement of the approach in this study, the researcher connects it with a neuroscientific theory which is still relevant to the theory of intelligence in the mastery of *mufrodāt* and linguistics. This is in line with what was conveyed by the leader of the boarding school and the companion of the learning students who emphasized that the students were still at the basic stage in Arabic language material. This research is still categorized as incomplete because researchers have not

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<sup>44</sup> Ghazala, Noreen, R. N. Awan, and H. Fatima, “Effect of Brain-Based Learning on Achievement of VII Graders in Mathematics,” *Journal of Elementary Education* 27, no. 2 (2017): 85–97.

<sup>45</sup> Benyamin S. Bloom, *Taksonomy of Educational Objectives* (London: Longman Group Ltd., 1979).

detailed in analyzing the application of neuroscience intelligence in teaching Arabic. Therefore, the researcher recommends to academics, practicing educators, and Islamic boarding schools to continue and perfect this research which focuses on learning Arabic. Overall, this research has implications for classical and modern Arabic learning in the future.

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### **Author Contributions Statement**

The first author's contribution, MJ focused on the ideas, concepts, substance, and research data related to this research. Next, YY who was the director of Arabic language teaching theory, SS who was concerned with the neuroscience theory, MH and AA reinforced the Arabic language development theory and added to the scope of this research.

### **References**

- Aase, Ingvild, Johannes Hendrik Langeveld, Jan Olav Johannessen, Inge Joa, Ingvild Dalen, and Wenche ten Velden Hegelstad. "Cognitive Predictors of Longitudinal Positive Symptom Course in Clinical High Risk for Psychosis." *Schizophrenia Research: Cognition* 26 (2021): 1-7. <https://doi.org/10.1016/j.scog.2021.100210>.
- Abu Bakar Shiddiq. "The Application of «Nemo» Artificial Intelligence in Arabic Language Learning in the 4.0 Revolution Era at Al-Khalifah Islamic Boarding School Cibubur." *Ijlecr - International Journal of Language Education and Culture Review* 6, no. 1 (2020): 58–61. <https://doi.org/10.21009/ijlecr.061.07>.
- Ahmad, Zainal Arifin. "Pengembangan Model Pembelajaran Bahasa Arab Berbasis Teori Multiple Intelligence." *Al Mahāra: Jurnal Pendidikan Bahasa Arab* 1, no. 1 (2015): 1–18. <https://doi.org/10.14421/almahara.2015.011-01>.
- Ahmed, Asad Q. "The Reception of Avicenna's Theory of Motion in the Twelfth Century." *Arabic Sciences and Philosophy* 26, no. 2 (2016): 215–243. <https://doi.org/10.1017/S0957423916000023>.
- Albantani, Azkia Muharom, and Ahmad Madkur. "Musyahadat Al Fidyu: Youtube-Based Teaching and Learning of Arabic as Foreign Language (AFL)." *Dinamika Ilmu* 17, no. 2 (2017): 291–308. <https://doi.org/10.21093/di.v17i2.854>.

- Alhojailan, Ahmad I. "Developing an Understanding of The Sources of Some Graduate Students' Perceptions of Academic Writing." *Indonesian Journal of Applied Linguistics* 11, no. 2 (2021): 281–291. <https://doi.org/10.17509/ijal.v11i2.34265>.
- Alwishah, Ahmed. "Avicenna on Animal Self-Awareness, Cognition and Identity." *Arabic Sciences and Philosophy* 26, no. 1 (2016): 73–96. <https://doi.org/10.1017/S0957423915000120>.
- Amrulloh, Muhammad Afif, and Munirul Ikhwan. "Stylistic of The Qur'an: Reading the Story of Sulaiman." *Arabiyat: Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban* 8, no. 1 (2021): 17–31. <http://dx.doi.org/10.15408/a.v8i1.18906>.
- Argondizzo, Carmen, and Gillian Mansfield. "Wellbeing in Language Learning and Teaching." *CercleS* 11, no. 2 (2021): 263–268. <https://doi.org/10.1515/cercles-2021-2034>.
- Bahrudin, Uril, Halomoan, and Mualimin Mochammad Sahid. "Implementation of Hots in Debate Strategy to Improve the Ability of Speaking Arabic Among Students." *Solid State Technology* 63, no. 4 (2020): 816–826.
- Bloom, Benyamin S. *Taksonomy of Educational Objectives*. London: Longman Group Ltd., 1979.
- Booth, Marilyn. "Zaynab Fawwāz's Feminist Locutions." *Journal of Arabic Literature* 52 (2021): 37–67. <https://doi.org/10.1163/1570064x-12341419>.
- Colmenares, Angel, Xu Yan, and Weiguo Wang. "Determinants in the Forecast of the Gross National Income of China and India from 1952 to 2015." *Journal of Management Science and Engineering* 6, (2021): 268–294. <https://doi.org/10.1016/j.jmse.2021.06.001>.
- Creswell, John W. *Penelitian Kualitatif & Desain Riset: Memilih Diantara Lima Pendekatan*. Yogyakarta: Pustaka Pelajar, 2014.
- Desfa, Yusmaliana, Suyadi, Widodo Hendro, and Suryadin Asyraf. "Creative Imagination Base on Neuroscience: A Development and Validation of Teacher's Module in Covid-19 Affected Schools." *Universal Journal of Educational Research* 8, no. 1 (2020): 5849–5858. <https://doi.org/10.13189/ujer.2020.082218>.
- Giaber, Jamal, and Hala Sharkas. "Rendering Translation Studies Terminology from English into Arabic: Identification of Methodology and Assessment of Adequacy." *International Journal of Arabic-English Studies* 21, no. 2 (2021): 125–146. <https://doi.org/10.33806/ijaes2000.21.2.7>.
- Hadiyanto, Andy, Cendra Samitri, and Siti Maria Ulfah. "Model Pembelajaran Bahasa Arab Multiliterasi Berbasis Kearifan Lokal di Penguruan Tinggi Negeri." *Hayula: Indonesian Journal of Multidisciplinary Islamic Studies* 4, no. 1 (2020): 117–140.
- Hustad, Katherine C., Tristan J. Mahr, Phoebe Natzke, and Paul J. Rathouz. "Speech Development between 30 and 119 Months in Typical Children i: Intelligibility Growth Curves for Single-Word and Multiword Productions." *Journal of Speech, Language, and Hearing Research* 64, no. 10 (2021): 3707–3719. [https://doi.org/10.1044/2021\\_JSLHR-21-00142](https://doi.org/10.1044/2021_JSLHR-21-00142).
- Luke, Chad, Eric T. Beeson, Raissa Miller, Thomas A. Field, and Laura K. Jones. "Counselors' Perceptions of Ethical Considerations for Integrating Neuroscience

- With Counseling.” *The Professional Counselor* 10, no. 2 (2020): 204–219. <https://doi.org/10.15241/cl.10.2.204>.
- Mishar, Rezki, and Yuni R. Bangun. “Create the EQ Modelling Instrument Based on Goleman and Bar-On Models and Psychological Defense Mechanisms.” *Procedia - Social and Behavioral Sciences* 115 (2014): 394–406. <https://doi.org/10.1016/j.sbspro.2014.02.446>.
- Noureen, Ghazala, R. N. Awan, and H. Fatima. “Effect of Brain-Based Learning on Achievement of VII Graders in Mathematics.” *Journal of Elementary Education* 27, no. 2 (2017): 85–97.
- Nursyamsiah, Nunung, Hikmah Maulani, and Shofa Musthofa Khalid. “Stylistics of Nida Ilahi and Its Implications in Character Learning.” *Jurnal Al Bayan: Jurnal Jurusan Pendidikan Bahasa Arab* 13, no. 2 (2021): 353–68. <https://doi.org/10.24042/albayan.v13i2.9247>.
- Nuryana, Zalik, and Suyadi Suyadi. “Character Development Based on Hidden Curriculum at the Disaster-Prone School.” *Journal of Education and Learning (EduLearn)* 13, no. 2 (2019): 219–225. <https://doi.org/10.11591/edulearn.v13i2.10058>.
- Pereira Soares, Sergio Miguel, Maki Kubota, Eleonora Rossi, and Jason Rothman. “Determinants of Bilingualism Predict Dynamic Changes in Resting State EEG Oscillations.” *Brain and Language* 223, (2021): 1-13, <https://doi.org/10.1016/j.bandl.2021.105030>.
- Putri, Hesty Maulida Eka, and Muassomah. “Tiktok Application as a Project-Based Arabic Learning Media.” *Alsinatuna* 7, no. 2 (2020): 139–154.
- Ritonga, Mahyudin, Martin Kustati, Meliza Budiarti, Ahmad Lahmi, Musda Asmara, Rahadian Kurniawan, Neli Putri, and Endri Yenti. “Arabic as Foreign Language Learning in Pandemic COVID-19 as Perceived by Students and Teachers.” *Linguistics and Culture Review* 5, no. 1 (2021): 75–92. <https://lingcure.org/index.php/journal/article/view/726>.
- Rubbo, Priscila, Claudia Tania Picinin, and Luiz Alberto Pilatti. “Innovation and Economic Complexity in BRICS.” *Int. J. Knowledge Management Studies* 12, no. 1 (2021): 66–79. <https://doi.org/10.1504/IJKMS.2021.112222>.
- Rutgers, Dieuwerke, Michael Evans, Linda Fisher, Karen Forbes, Angela Gayton, and Yongcan Liu. “Multilingualism, Multilingual Identity and Academic Attainment: Evidence from Secondary Schools in England.” *Journal of Language, Identity & Education* (2021): 1–19. <https://doi.org/10.1080/15348458.2021.1986397>.
- Sari, Dina Merris Maya, and Yudy Prasetyo. “Project-Based-Learning on Critical Reading Course to Enhance Critical Thinking Skills.” *Studies in English Language and Education* 8, no. 2 (2021): 442–456. <https://doi.org/10.24815/siele.v8i2.18407>.
- Setiyawan, Agung. “Problematika Keragaman Latar Belakang Pendidikan Mahasiswa dan Kebijakan Program Pembelajaran Bahasa Arab.” *Arabiyat: Jurnal Pendidikan Bahasa Arab dan Kebahasaaraban* 5, no. 2 (2018): 195–213.
- Shearer, Branton C. “The Theory of Multiple Intelligences After 40 Years: A Scientific Idea Whose Time Has Come or Gone?” *An Interdisciplinary Journal Wwww.Psychologyandeducation.Net* 57, no. 7 (2020): 487–494.



- <http://psychologyandeducation.net/pae/index.php/pae/article/view/74>.
- Sugiyono. *Metode Penelitian Kuantitatif Kualitatif Dan R&D*. Bandung: Alfabeta, 2017.
- Suyadi, and Hendro Widodo. "Millennialization Of Islamic Education Based on Neuroscience in the Third Generation University in Yogyakarta Indonesia." *QIJIS: Qudus International Journal of Islamic Studies* 7, no. 1 (2019): 173–202. <https://doi.org/10.21043/qijis.v7i1.4922>.
- Suyadi, Suyadi, and Sutrisno. "A Genealogical Study of Islamic Education Science at The Faculty of Ilmu Tarbiyah Dan Keguruan UIN Sunan Kalijaga." *Al-Jami'ah: Journal of Islamic Studies* 56, no. 1 (2018): 28–95. <https://doi.org/10.14421/ajis>.
- Suyadi, Suyadi, Zalik Nuryana, and Niki Alma Febriana Fauzi. "The Fiqh of Disaster: The Mitigation of Covid-19 in the Perspective of Islamic Education-Neuroscience." *International Journal of Disaster Risk Reduction* 51, no. 2 (2020): 1–15. <https://doi.org/doi.org/10/1016/J.ijdr.2020.101848>.
- Suyadi, Suyadi, Zalik Nuryana, and Sutrisno Sutrisno. "The Religion in Higher Education Curriculum Referring to Indonesian Qualification Framework: The Inclusion of Neuroscience and Anti-Corruption Education." *International Journal of Education and Learning* 3, no. 1 (2021): 38–44. <https://doi.org/10.31763/ijele.v3i1.93>.
- Suyadi, Suyadi, Zalik Nuryana, Sutrisno, and Baidi. "Academic Reform and Sustainability of Islamic Higher Education in Indonesia." *International Journal of Educational Development* 89 (2022): 1–11. <https://doi.org/10.1016/j.ijedudev.2021.102534>.
- Suyadi, Suyadi. "Hybridization of Islamic Education and Neuroscience: Transdisciplinary Studies of Aql in the Quran and the Brain in Neuroscience." *Dinamika Ilmu* 19, no. 2 (2019): 237–249. doi: <http://doi.org/10.21093/di.v19i2.1601>.
- Tarvirdizdeh, Zahra, and Vahid Nimehchisalem. "Rhetorical Structure in the Problem Statement Section of Iranian Postgraduate Students' Research Projects." *Studies in English Language and Education* 8, no. 2 (2021): 578–595. <https://doi.org/10.24815/siele.v8i2.19118>.
- Thiele, Jan. "Conceptions of Self-Determination in Fourth/Tenth-Century Muslim Theology: Al-Bāqillānī's Theory of Human Acts in Its Historical Context." *Arabic Sciences and Philosophy* 26, no. 2 (2016): 245–269. <https://doi.org/10.1017/S0957423916000035>.
- Thierry, François. "Arlette Nègre et Le Cabinet Des Médailles." *Arabica* 67 (2020): 458–459. <https://doi.org/10.1163/15700585-12341583>.
- Thohir, Muhammad, Samsul Ma'arif, Junaedi, Hisbullah Huda, and Ahmadi. "From Disruption to Mobilization: Ire Teachers' Perspectives on Independent Learning Policy." *Cakrawala Pendidikan* 40, no. 2 (2021): 359–373. <https://doi.org/10.21831/cp.v40i2.39540>.
- Thompson, Gregory A. "Equitable Education and the Language Ideological Work of Academic Language (Introduction to Special Issue on Academic Language)." *Language and Education* 35, no. 6 (2021): 501–4. <https://doi.org/10.1080/09500782.2021.1982964>.

- Vaughn, Kelly A., My V.H. Nguyen, Juliana Ronderos, and Arturo E. Hernandez. "Cortical Thickness in Bilingual and Monolingual Children: Relationships to Language Use and Language Skill." *NeuroImage* 243 (2021):1-11. <https://doi.org/10.1016/j.neuroimage.2021.118560>.
- Zumor, Abdulwahid Qasem Al. "Challenges of Using EMI in Teaching and Learning of University Scientific Disciplines: Student Voice." *International Journal of Language Education* 3, no. 1 (2019): 74–90. <https://doi.org/10.26858/ijole.v1i1.7510>.